Resume for Dr. Todd A. Cerni
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EDUCATION

University of Arizona	Tucson, AZ	Ph.D. Atmospheric Physics
Indiana University	Bloomington, IN	M.S. Physics
Marquette University	Milwaukee, WI	B.S. Physics

PROFESSIONAL EXPERIENCE

Particle Measuring Systems, Boulder, CO
Electro-Optical Specialist, 1997 - 2000
Manager of Research, 2000 - present

Summary: Applied research was accomplished on the semiconductor industry CMP (Chemical Mechanical Planarization) slurry measurement problem. This research lead to the design, development, laboratory and field testing of two new commercial instruments, the SlurryChek and SlurryAlert, for on-line spectroscopic measurement of slurry quality and particle size distribution (Cerni, 1999a; 1999b; 1999c; 2000a; 2000b). These are the only instruments available which utilize optical methods for measuring undiluted CMP slurry. Acting as RedCloud Project Manager, development was completed on a prototype aerosol optical particle counter, based on an active cavity diode pumped solid state laser, which offers the highest sensitivity available in the industry. Duties included Chairmanship of the Intellectual Property Committee, which administers all intellectual property matters for the Company.

DOE Contractor & Private Consultant, Littleton, CO
1995 - 1997

Summary: A new pyrgeometer design was developed for a client. It represents the first radiometer capable of measuring infrared hemispheric irradiance with any meaningful spectral resolution, though an innovative combination of hemispheric field of view (FOV) fore-optics and standard interference filters. This hemispheric FOV spectroradiometer design is suitable for use at any UV, visible or IR wavelength. Software and hardware infrastructure was built for real time Internet acquisition and analysis of multi-spectral GOES imagery and related atmospheric data, acquired directly from the U. of Wisconsin Space Science and Engineering Center. Pioneering work was accomplished relating to the quantitative analysis of GOES (Geosynchronous Operational Environmental Satellite) imagery for solar energy resource assessment (Cerni, 1996; Cerni and Price, 1997), under DOE contract.

K.C. Research Corporation, Littleton, CO
Chief Physicist, 1989 - 1994

Summary: Spectroradiometer systems for improved Naval infrared target signature measurements were designed and evaluated (Cerni, 1989). Innovative radiometric sensors for

non-contact temperature and spectral emissivity measurements of high temperature surfaces were designed and tested, for aerospace and semiconductor applications (Cerni, 1991a; 1992). The performance of infrared differential absorption hygrometers was critically evaluated (Cerni, 1994). An innovative, non-contact infrared laser sensor for trace gas monitoring was designed, evaluated and tested (Cerni, 1991b; 1993). The LOWTRAN 7 radiative transfer model and HITRAN 92 data base were utilized as design tools to support these projects. This work was accomplished while serving as Principal Investigator on R&D contracts/grants from 5 Federal agencies.

OPHIR Corporation, Lakewood, CO
Physicist & Senior Physicist, 1984 - 1988

Summary: As principal investigator on 11 Federal contracts and aerospace subcontracts, a record of successful R&D proposal authorship and project management was established. This included recruitment and supervision of engineers, scientists, programmers, and technicians. Experience was gained in the numerical modeling, design, calibration, testing, and evaluation of a wide range of active and passive, infrared and electro-optical sensor systems, including field test program management.

Description: Precision infrared radiometers were designed, calibrated, field and flight tested (Cerni, 1985b; Nelson and Cerni, 1986; Cerni et al., 1987a). Infrared laser and lidar systems were designed and developed for atmospheric wind shear measurement (Cerni and Fetzer, 1987) and trace gas detection (Cerni, 1986b). Infrared differential absorption hygrometers were developed for fast response and operation in harsh environments (Cerni, 1986a; Cerni et al., 1987b; 1987c), resulting in a new commercial product line (Nelson and Cerni, 1989). Infrared remote sensing algorithms were developed for retrieval of atmospheric temperature profiles from aircraft and surface platforms (Nelson and Cerni, 1984; Cerni and Nelson, 1984; Cerni, 1985a; Cerni et al., 1987a; Cerni and Tzur, 1987). Successful design and management of infrared radiometer and hygrometer field test programs was demonstrated at Otis ANGB, MA (Cerni et al., 1987a), San Nicolas Island, CA (FIRE program), and White Sands Missile Range, NM (Cerni, 1994). Participation in a series of contracts with Northrop corporation, as project scientist and later principal investigator, lead to the design, development, and flight testing of passive and active infrared sensors for non-contact measurement of multiple atmospheric parameters from low observable (B-2) aircraft.

University of Wyoming, Atmospheric Science Dept., Laramie, WY
Research Associate & Assistant Professor, 1978 - 1984

Summary: Experience was gained and competency demonstrated in airborne cloud physics research, aircraft instrumentation evaluation and testing, analysis of large atmospheric data sets, field program design and implementation, and atmospheric radiative transfer numerical modeling.

Description: While logging 150 research flights on the Wyoming instrumented aircraft (200T Super King Air), experience was gained in the implementation of large, multi-agency field programs such as HIPLEX and CCOPE (Cooper et al., 1982a; 1982b; 1982c; 1982d; 1982e; Dye et al., 1984; 1986). Data was analyzed from multiple aircraft, surface radars and surface meteorological networks. Research focused on ice origins, ice production, precipitation development, radar meteorology, and cloud seeding (Cerni and Cooper, 1980;

Cerni, 1982b; Dye et al., 1984; 1986). Airborne optical probes for hydrometeor size and concentration measurement were evaluated and tested (Cerni and Cooper, 1982; Cerni, 1982c; 1983). Numerical models of atmospheric radiative transfer phenomenon were developed and analyzed (Cerni, 1982a; Cerni and Parish, 1984). University teaching accomplishments included 4 atmospheric science (Intro. to Meteorology, Atmospheric Energetics, Cloud Physics, Atmospheric Radiation and Optics) and 1 engineering course (Thermodynamics).

University of Wyoming, Physics Dept., Laramie, WY
Research Associate, 1976 - 1978

Summary: Numerical modeling and experimental research in atmospheric radiation/optics and satellite remote sensing were accomplished.

Description: Inversion algorithms and related numerical models were developed for analysis of remote sensing data from the SAM (Stratospheric Aerosol Measurement) and SAGE (Stratospheric Aerosol and Gas Experiment) series of NASA satellite solar radiometers (Pepin and Cerni, 1977; Pepin and Cerni, 1978a; 1978b; Cerni and Pepin, 1980a; 1980b; Pepin et al., 1980). A numerical optical model was developed for artificial aerosol hazes (Cerni and Pepin, 1978). Hardware design team participation focused on satellite and balloon-mounted solar radiometers. Experimental research in radar meteorology and solar radiometry, begun in graduate school, was published (Cerni and Krider, 1976; Cerni, 1976; 1978).

PUBLICATIONS, PATENTS, AND REPORTS

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